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PROCESS AUTOMATION SIGNAL PROCESSING UNIT MOUNTABLE ON A HAT RAIL

The invention relates to a signal processing unit for use in process automation technology and mountable on a top-hat rail (hereinafter "hat rail"), as defined in the preamble of claim 1.

Often used in process automation technology are recording devices, which serve for documentation, monitoring and visualization of measuring points. Newer recording devices are, as a rule, processor-controlled and frequently have a connection to control systems. The connection is accomplished mostly over a fieldbus. Examples of such field busses are Profibus®, Foundation Fieldbus®, CAN-Bus®, etc..

These recording devices include, as a rule, a housing with multiple plug-in cards, e.g. a card with a microprocessor (CPU-card), cards with analog, or digital, inputs and outputs (I/O cards) and a card for the power supply.

For visualizing the measured values, a display unit is provided, which is connected with the housing and is organized around a frame serving to receive a display, the keypad and at least one circuit board. Such recording devices are frequently installed in switchboards, e.g. control panels, and are, therefore, referred to as switchboard-installable devices. An example of such switchboard-installable devices is the product MEMOGRAPH of the firm Endress + Hauser.

Besides switchboard-installable devices, also frequently used in process automation technology are so-called hat-rail devices. Such devices are designed for especially easy mounting on a hat rail.

Frequently, it is desired to modify switchboard-installable devices for mounting on a hat rail.

Especially in the case of recording devices constructed as switchboard installable devices, mounting on a hat rail is implementable only with considerable effort. As a rule, new construction is simpler to implement than a retrofitting of existing recording devices.

Even with new construction, however, such is burdened with significant costs.

An object of the invention is, therefore, to provide a process automation signal processing unit for mounting on a hat rail, which is based on an existing recording device in the form of a switchboard-installable device and which is simple and cost-effective in implementation, without requiring expensive designing steps.

This object is achieved by a process automation signal processing unit mountable on a hat rail, as such unit is defined in claim 1.

Advantageous further developments of the invention are set-forth in the dependent claims.

The invention will now be explained in greater detail on the basis of an example of an embodiment illustrated in the drawing, the figures of which show as follows:

Fig. 1 perspective view of signal processing unit with adaptation module;

Fig. 2 perspective view from the rear of a signal processing unit according to Fig. 1;

Fig. 3 perspective view of adaptation module according to Fig. 1.

Fig. 1 shows a process automation signal processing unit 1 for mounting on a hat rail, including a housing 3 serving to receive a plurality of plug-in cards

5, 6, 7, 8 (CPU card, I/O cards, power supply card). Provided on the rear side of housing 3 are two interfaces, or ports, S1 and S2 for connecting to other computer units.

Connectable with the housing 3 is an adaptation module 20, shown here in exploded view. Adaptation module 20 includes two angle sheets 50 and 51. Shown alongside the adaptation module 20 is a display unit 10, which is likewise connectable to housing 3. Connected with the display unit 10, signal processing unit 1 represents a per se known, recording device, suitable for installation in a switchboard.

The display unit 10 is composed essentially of a frame 11 with a display 12 and a keypad 13. Presentable in display 12 are e.g. plots of data. Keypad 13 enables operator input.

The display unit 10 includes a circuit board 16, which can be seen better in Fig. 2. Circuit board 16 has several card edge connectors 25A, 26A, 27A, 28A, as well as an evaluation electronics 40 for the display 12.

Fig. 3 shows a rear view of the adaptation module 20 with its circuit board 16A in exploded view.

Now the functioning of the invention will be explained in greater detail. By simple replacement of the display unit 10 by the adaptation module 20, an existing recording device for switchboard mounting can be converted into a process automation signal processing unit for mounting on a hat rail. Upon the placing of the adaptation module 20 onto the housing 3, the connection of the plug-in cards is automatically established by the card edge connectors 25, 26, 27, 28. The plug-in edges 25B, 26B, 27B, 28B on the plug-in cards 5, 6, 7, 8 are thus situated for fit both with respect to the card edge connectors 25A, 26A, 27A, 28A on circuit board 16 and with respect to the card edge connectors 25, 26, 27, 28 on circuit board 16A.

The signal processing unit 1 of the invention is especially suited for inaccessible locations of use, such as pump stations, since, in such an application, a visualization of the measured values has only limited importance for the user. As a rule, the measured values are shown on a remote computer unit, which is connected via the interfaces S1 or S2, or by modem connection, with the signal processing unit. Via such computer unit, also adjustments at the signal processing unit can be accomplished, since, in the adaptation module 20, a keypad is no longer present. Conductive traces on the circuit board 16, or 16A, as the case may be, serve for the electrical connection of the plug-in cards 5, 6, 7, 8.

Since no display is provided in the case of the adaptation module 20, the display operating electronics 40 can be omitted, this providing a cost savings in the manufacture of the adaptation module.

The resiliently mounted angle sheets 50, 51 enable a simple, snap-in connection on a hat rail.

Since the signal processing unit 1 has a significant weight, the adaptation module with the angle sheets 50, 51 is made of steel sheet, to assure a secure mounting of the unit on a hat rail.

List of Reference Characters

1	signal processing unit
3	housing
5, 6, 7, 8	plug-in cards
10	display unit
11	frame
12	display
13	keypad
16, 16A	circuit boards
20	adaptation module
25 - 28	card edge connectors
25A - 28A	card edge connectors
25B - 28B	plug-in edges
40	display operating electronics
50, 51	angle sheets
S1, S2	interfaces